

NASA TECH BRIEF

Manned Spacecraft Center



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Instant Acting Adhesive System

The problem:

An adhesive to develop 80% of a minimum bond strength of 250 psi (lap shear) less than 30 seconds after activation was required. The adhesive had to provide a minimum bond strength in vacuum over a temperature range of -157° C and 177° C. It was also required to maintain a bond strength of 200 psi (lap shear) for 56 days exposure in the same vacuum and temperature conditions.

The solution:

A heat curing adhesive system was developed consisting of the following materials:

- Solid bisphenol - a type epoxy resin
- Pryomellitic Dianhydride - curing agent
- Dimethyl-paratoluidine capsules (DMpT) - accelerator

How it's done:

To effect a bond the epoxy resin and dianhydride are mixed at a temperature slightly above the melting point of the epoxy resin. The bonding is then made while the mixture is tacky. The system cures in 20 to 30 seconds when the surfaces are brought into contact in the

presence of the DMpT - or if the temperature is raised to 175° to 185° C without the DMpT.

The advantages offered by the new adhesive may be summarized as: rapid curing, good and durable bond strength, stability, ease of handling, and low toxic hazard.

Because of this it may be useful industrial and domestic prototype bonding and clamping operations.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Manned Spacecraft Center, Code JM7
Houston, Texas 77058
Reference: TSP71-10317

Patent status:

No patent action is contemplated by NASA.

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